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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,895	09/16/2003	Gail A. Alverson	324758001US2	4522

25096   7590   05/23/2008
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EXAMINER
TO, JENNIFER N

ART UNIT	PAPER NUMBER
2195	

MAIL DATE	DELIVERY MODE
05/23/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>10 March 2008</u>.

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-13 and 15-27</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) <u>19-22</u> is/are allowed.

6) ☒ Claim(s) <u>1-13,15-18,23-25 and 27</u> is/are rejected.

7) ☒ Claim(s) <u>26</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____.

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>03/10/2008</u>.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   Claims 1-13, 15-18, and 23-27 are presented for examination.

2.   Claims 19-22 are allowed.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

4.   Claims 13, and 15-18 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly

claim the subject matter which applicant regards as the invention.

      a.   The claim language in the following claims is not clearly

understood:

          i.   as per claim 13, lines 15-16, it is uncertain what is meant by

"so that the operating system can defer <u>swapping in</u> the task until

an event occurs that may cause the task to become unblocked" (i.e.

the claim recited from line 1-15, the operations of task "swapping

out" not task "swapping in", thus the concluded resulted of these

operations should be "so that the operating system can defer

<u>swapping out</u> the task until an vent occurs that may cause the task

to become unblocked").

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

6.   Claims 1-13, 15-18, and 23-25 are rejected under 35 U.S.C. 103(a) as

being unpatentable over Jones et al. (hereafter Jones) (U.S. Patent No.

5812844), in view of Turner et al. (hereafter Turner) (U.S. Patent no. 6505229),

and further in view of Applicant Admitted Prior Arts (hereafter AAPA).

7.   Jones was cited in the previous office action.

8.   As per claim 1, Jones teaches the invention substantially as claim

including a method in a computer system for scheduling tasks (abstract), the

method comprising:

        notifying a task that the task is being preempted from utilizing the

processor (col. 11, lines 26-33; col. 12, lines 20-24; col. 19, lines 9-24);

        in response to the notification, receiving an indication from the task that it

is ready to be swapped out and an indication as to whether the task is blocked

(col. 12, lines 20-28; col. 20, lines 15-20);

        swapping the task out (col. 20, lines 20-15);

after swapping the task out, determining whether the task can be swapped

back in, and when it is determining that the task can be swapped back in (col. 20,

lines 15-25); and

swapping the task back in (col. 20, lines 15-25).

9.   Jones did not specifically teach in details that when task ready to be

swapped back in, determining whether the task indicated that it was blocked,

when it is determined that the task indicated that it was blocked, determining

whether an event has occurred that may cause the task to unblock, when it is

determined that an event occurred that may cause the task to unblock, swapping

the task in, when it is determined that an vent did not occur that may cause the

task to unblock, deferring the swapping in of the task until an event occurs that

may cause the task to become unblocked, and when it is determined that the

task did not indicate that it was blocked, swapping the task in.

10.   However, Turner teaches in details that when task ready to be swapped

back in, determining whether the task indicated that it was blocked, when it is

determined that the task indicated that it was blocked, determining whether an

event has occurred that may cause the task to unblock, when it is determined

that an event occurred that may cause the task to unblock, swapping the task in,

when it is determined that an event did not occur that may cause the task to

unblock, deferring the swapping in of the task until an event occurs that may

cause the task to become unblocked, and when it is determined that the task did

not indicate that it was blocked, swapping the task in (col. 5, lines 55-66; col. 6,

lines 3-9, 20-40; col. 7, lines 20-36, when thread C swapping out, C in a

suspend-waiting state, thread A current is executed when thread C swapped out,

and when thread A finished with its time slice, thread B is executed, thread C

moved to a ready queue, thus thread is ready to be swapped in but waiting for

event to occur (i.e. thread B finished executed and release the resource),

swapping thread C back in when it is time and the resource is available for the

C).

11.   It would have been obvious to one of an ordinary skill in the art at the time

the invention was made to have combined the teaching of Jones and Turner

because both Jones and Turner teaching of switching the task in and out based

on the constrain and resource availability of the system, and in addition Turner

teaching of although the task ready to be swapped back in for execution, Turner's

system determining whether the task is blocked, swapping the task back in when

the event occurred that unblocked the task, otherwise deferring the task

swapping until an event occur to unblocked the task would improve the integrity

of Jones's system by maintaining efficient use and re-reuse of system resource

(Turner, col. 2, lines 45-46).

12.   The combination of Jones and Turner did not specifically teach the task

executing on a parallel processor architecture having multiple simultaneously

executing protection domains.

13.   However AAPA teaches the task executing on a parallel processor

architecture having multiple simultaneously executing protection domains (AAPA,

specification, paragraph [0003]).

14.   It would have been obvious to one of an ordinary skill in the art at the time

the invention was made to have combined the teaching of Jones, Turner, and

AAPA because AAPA teaching of the task executing on a parallel processor

architecture having multiple simultaneously executing protection domains would

improve the integrity the combined Jones and Turner's system by a system that

executing different tasks simultaneously.

15.   As per claim 2, Turner further teaches the computer system is a

multithreaded computer system (col. 3, line 66).

16.   As per claim 3, in response to the notification, the task save its state (col.

1, lines 40-47).

17.   As per claim 4, Turner teaches that the event is an indication from an

operating system (col. 6, lines 6-8).

18.   As per claim 5, Jones teaches that the indication whether the task is blocked includes an identification of a thread of the task that is blocked (col. 15, lines 2-4).

19.   As per claims 6, Jones teaches that tracking a number of threads of the task that are blocked (col. 15, lines 63-67).

20.   As per claims 7-13, they are rejected for the same reason as claims 1-6 above.

21.   As per claim 15, Jones teaches incrementing a variable relating to the number of blocked threads (col. 16, lines 20-30). In addition, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to have recognized that the task is blocked when all the threads of the task are blocked.

22.   As per claim 16, Jones further teaches receiving in indication from the operating system that the thread is no longer blocked (col. 15, lines 62-67)

23.   As per claim 17, Jones teaches decrementing a variable relating to a number of blocked threads (col. 16, lines 20-30).

24.   As per claim 18, AAPA teaches the task does not know which of the

multiple protection domains on which it is executing (AAPA, specification,

paragraph [0007]).

25.   As per claims 23-25, they are rejected for the same reason as claims 1-6

above. In addition, AAPA teaches that multiple streams for scheduling tasks with

multiple threads (AAPA, specification, paragraph [0004]). It is also obvious to

one of an ordinary skill in the art at the time the invention was made to have

recognized that the task being blocked when all the streams executing threads of

the task are blocked.

Allowable Subject Matter

26.   Claims 19-22 are allowed.

27.   Claims 26-27 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

28.   The following is a statement of reasons for the indication of allowable

subject matter:

        The prior arts of recorded individually or in combination teaches the

claimed invention as recited in claims 1-13, 15-18, and 23-25 above. However,

the prior arts of recorded individually or in combination fail to teaches when the

task swapping in, it is executing on a different protection domain than the one it

was originally executing and the task being blocked as a result of all streams

assigned to the task executing virtual processor code in cooperated with the

recited claims.

Response to Arguments

29.   Applicant's arguments with respect to 1-13, 15-23, and 23-27 have been

considered but are moot in view of the new ground(s) of rejection.

Conclusion

30.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure (see attached PTO 892 form for details).

31.   Any inquiry concerning this communication or earlier communications from

the examiner should be directed to JENNIFER N. TO whose telephone number is

(571)272-7212. The examiner can normally be reached on M-T 6AM- 3:30 PM,

F 6AM- 2:30 PM.

32.   If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax

phone number for the organization where this application or proceeding is

assigned is 571-273-8300.

33.   Information regarding the status of an application may be obtained from

the Patent Application Information Retrieval (PAIR) system. Status information

for published applications may be obtained from either Private PAIR or Public

PAIR. Status information for unpublished applications is available through

Private PAIR only. For more information about the PAIR system, see http://pair-

direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-

free). If you would like assistance from a USPTO Customer Service

Representative or access to the automated information system, call 800-786-

9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/   Jennifer To
Supervisory Patent Examiner, Art Unit 2195   GAU 2195